

CLAIMS

1. A method for creating a block of $M \times N$ pixels with film grain for blending with an image to simulate film grain, where N and M are integers greater than zero, comprising the steps of:

receiving film grain information that includes at least one parameter that specifies an attribute of the film grain to appear in the image block;

deriving the non transmitted parameters based on pre-established default values;

selecting a film grain block of $M \times N$ pixels from among a set of previously established blocks containing film grain as a function of a pseudo-random number and at least one parameter characterizing the film grain; and

scaling all the pixel values in the block as indicated by at least one parameter characterizing the film grain; and

storing the created block of film grain into a pool of film grain blocks.

2. The method according to claim 1 wherein the selecting step further comprises the step of selecting from among a predetermined number of sets of 4096 values each.

3. The method according to claim 2 wherein each of the predetermined number of sets of values are arranged as a 512×8 matrix.

4. The method according to claim 3 wherein the predetermined number of sets of values are stored in 2's complement and range from [-127, 127].

5. The method according to claim 1 further comprising the steps of selecting a film grain block from among the pool of film grain blocks in accordance with a pseudo random number and a luma characteristic of the incoming image;

deblocking opposing edges of the selected film grain block; and

blending at least a portion of the deblocked selected film grain block with each pixel in the image block; and

clipping the image block pixels blended with film grain.

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6. A method for simulating film grain in an image block of pixels, comprising the steps of:

randomly selecting a block of film grain from a pool of pre-established film grain blocks for a luma value corresponding to a luma characteristic of the image block;

deblocking the selected film grain block;

blending at least a portion of the deblocked film grain block with each pixel of the image block to simulate film grain;

clipping the resultant blended pixels prior to output.

7. The method according to claim 6 wherein the pool of pre-established film grain blocks is created by the steps of: receiving film grain information that includes at least one parameter that specifies an attribute of the film grain to appear in the image block;

selecting a film grain block of $M \times N$ pixels from among a set of previously established blocks containing film grain as a function of a pseudo-random number; and

scaling all the pixel values in the block as indicated by one parameter in the received film grain information; and

storing the created block of film grain into a pool of film grain blocks.

8. The method according to claim 7 wherein the selecting step further comprises the step of selecting from among a predetermined number of sets of 4096 values each.

9. The method according to claim 8 wherein each of the predetermined number of sets of values is arranged as a 512×8 matrix.

10. The method according to claim 8 wherein the predetermined number of sets of values are stored in 2's complement and range from [-127, 127].

11. A data carrier containing video data for blending with film grain in accordance with the method of claim 7.

12. The method according to claim 11 wherein the data carrier comprises a DVD.

13. Apparatus for creating a block of $M \times N$ pixels, comprising,

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a first storage repository for storing a set of previously established $M \times N$ pixel blocks containing film grain, where M and N are integers;

a selector for selecting a film grain block of $M \times N$ pixels from the first repository as a function of a pseudo-random number; and

a scaling block for scaling all the pixel values in the selected film grain block in accordance with at least one parameter of film grain information received by the scaling block; and

a second storage repository storing the scaling film grain block.

14. The apparatus according to claim 13 wherein the first storage repository stores a predetermined number of sets of 4096 values each.

15. The apparatus according to claim 13 wherein each of the predetermined number of sets of values is arranged as a 512×8 matrix.

16. The apparatus according to claim 15 wherein the predetermined number of sets of values are stored in 2's complement and range from [-127, 127].

17. Apparatus for simulating film grain in an image block of pixels, comprising, a pool of previously established film grain values;

a selector for randomly selecting a block of film grain from the pool of pre-established film grain blocks for a luma value corresponding to a luma characteristic of the image block;

a deblocking filter for deblocking the selected film grain block;

an adder for blending at least a portion of the deblocked film grain block with each pixel of the image block to simulate film grain; and

a clipper for clipping the resultant blended pixels prior to output.